

Application No.: 09/684,628
Attorney Docket No.: 5259-04700.US.01
Amendment dated June 16, 2005
Reply to Office Action of February 18, 2005

Amendments to the Claims

The following listing of claims will replace all prior versions and/or listings of claims in the above-identified application.

Listing of Claims:

1. (currently amended): A connector for an elongated member, comprising:
a body;
a first opening in the body configured to hold the elongated member;
an engager;
a cam system positioned in a cam system opening in the body, wherein the cam system is configured to extend the engager into the first opening to couple the body to the elongated member; and
a visual indicator that informs a user that the cam system is engaged.
2. (original): The connector of claim 1, wherein the engager comprises a surface of the cam system.
3. (original): The connector of claim 1 wherein the engager further comprises a surface that contacts the elongated member, and wherein a portion of the surface is textured to increase a coefficient of friction between the surface and the elongated member.
4. (previously amended): The connector of claim 1, wherein a portion of a surface defining the first opening is textured to increase a coefficient of friction between the surface and the elongated member.

5. (original): The connector of claim 1, wherein a portion of the cam system is angulated within the body substantially perpendicular to a longitudinal axis of the body.
6. (original): The connector of claim 1, wherein a portion of the cam system is angulated within the body at an angle greater than about 45° relative to a longitudinal axis of the body.
7. (original): The connector of claim 1, wherein a portion of the cam system is angulated within the body at an angle greater than about 60° relative to a longitudinal axis of the body.
8. (previously amended): The connector of claim 1, wherein the engager extends into the first opening when the cam system is rotated, and wherein a rotation range of the cam system is limited.
9. (original): The connector of claim 8 wherein the rotation range of the cam system is limited to less than about 360°.
10. (original): The connector of claim 8 wherein the rotation range of the cam system is limited to less than about 180°.
11. (original): The connector of claim 8 wherein the rotation range of the cam system is limited to less than about 90°.
12. (original): The connector of claim 1, further comprising a vibrational indicator that informs a user that the cam system is engaged.
13. (canceled)

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14. (currently amended): The connector of claim 131, further comprising a drive tool that activates the cam system, and wherein the visual indicator is a position of a handle of a drive tool relative to a position of the elongated member.
15. (original): The connector of claim 1, further comprising a second opening in the body configured to hold a second elongated member.
16. (original): The connector of claim 15, wherein the body is substantially unbendable.
17. (previously amended): The connector of claim 15, wherein the body is bendable to allow adjustment of the first opening relative to the second opening.
18. (previously amended): The connector of claim 15, wherein the cam system is positioned between the first opening and the second opening.
19. (original): The connector of claim 15, wherein the body comprises a first section configured to move relative to a second section, and further comprising a fastener configured to inhibit movement of the first section relative to the second section.
20. (original): The connector of claim 1, wherein the connector is a transverse connector of a bone stabilization system.
21. (original): The connector of claim 1, wherein the connector is a transverse connector of a spinal stabilization system.
22. (original): The connector of claim 1, wherein the body comprises a first section and a second section, wherein a position of the first section is adjustable relative to the second section, and further comprising a fastening system configured to fix the position of the first section relative to the second section during use.

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23. (currently amended): An engaging mechanism for coupling a connector to an elongated member, comprising:

a cam system positioned in a cam system opening in the connector, the cam system configured to extend an engager into an opening in the connector during use to couple the connector to the elongated member, wherein the cam system is angulated within the transverse connector substantially perpendicular to a longitudinal axis of the transverse connector.

24. (original): The engaging mechanism of claim 23, wherein removal of a cam system from the connector is inhibited.

25. (original): The engaging mechanism of claim 23, wherein the engager comprises a surface of the cam system.

26. (original): The engaging mechanism of claim 23, wherein a contact surface of the engager that couples the connector to the elongated member comprises a textured surface.

27. (original): The engaging mechanism of claim 23, wherein a portion of a surface of the opening that contacts the elongated member is textured.

28. (original): The engaging mechanism of claim 23, wherein the cam system is configured to couple the connector to the elongated member when the cam system is rotated.

29. (original): The engaging mechanism of claim 23, wherein the cam system is configured to couple the transverse connector to the elongated member when the cam system is rotated, and wherein a rotation range of the cam system is limited.

30. (previously amended): The engaging mechanism of claim 29, wherein the rotation range of the cam system is limited to less than about 360°.

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31. (previously amended): The engaging mechanism of claim 29, wherein the rotation range of the cam system is limited to less than about 180°.

32. (previously amended): The engaging mechanism of claim 29, wherein the rotation range of the cam system is limited to less than about 90°.

33. (canceled)

34. (canceled)

35. (canceled)

36. (previously amended): The engaging mechanism of claim 23, wherein the connector opening includes an open side that allows the elongated member to be top loaded onto the connector.

37. (original): The engaging mechanism of claim 23, wherein a drive tool is used to rotate the cam system.

38. (original): The engaging mechanism of claim 37, wherein a position of the drive tool relative to the elongated member indicates if the transverse connector has been coupled to the elongated member.

39. (original): The engaging mechanism of claim 37 wherein a handle of the drive tool has an elongated portion that is substantially aligned with the elongated member when the transverse connector is coupled to the elongated member.

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40. (original): The engaging mechanism of claim 23, further comprising an indicator configured to vibrate when the cam system is rotated.
41. (previously amended): The engaging mechanism of claim 40, wherein the indicator comprises a pin that contacts a portion of the cam system.
42. (currently amended): A transverse connector comprising:
a body;
a first opening in the body configured to accept an elongated member;
a cam system positioned in a cam system opening in the body, wherein the cam system is in communication with the first opening; and
an engager configured to extend into the first opening to couple the elongated member to the body when the cam system is activated; and
wherein a drive tool is used to rotate the cam system.
43. (original): The transverse connector of claim 42, wherein the engager is a surface of the cam system.
44. (previously amended): The transverse connector of claim 42, wherein a surface of the body defining the first opening is textured.
45. (original): The transverse connector of claim 42, wherein the body includes an indentation that allows the body to be bent.
46. (original): The transverse connector of claim 42, wherein removal of a cam system from the body is inhibited.
47. (original): The transverse connector of claim 42, wherein a contact surface of the engager that couples the body to the elongated member comprises a textured surface.

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48. (original): The transverse connector of claim 42, wherein the cam system is configured to couple the body to the elongated member when the cam system is rotated.

49. (original): The transverse connector of claim 42, wherein the cam system is configured to couple the body to the elongated member when the cam system is rotated, and wherein a rotation range of the cam system is limited.

50. (original): The transverse connector of claim 49 wherein the rotation range of the cam system is limited to less than about 360°.

51. (original): The transverse connector of claim 49 wherein the rotation range of the cam system is limited to less than about 180°.

52. (original): The transverse connector of claim 49 wherein the rotation range of the cam system is limited to less than about 90°.

53. (original): The transverse connector of claim 42, wherein the cam system is angulated within the body substantially perpendicular to a longitudinal axis of the body.

54. (original): The transverse connector of claim 42, wherein the cam system is angulated within the body at an angle greater than about 45° relative to a longitudinal axis of the body and less than perpendicular to the longitudinal axis.

55. (original): The transverse connector of claim 42, wherein the cam system is angulated within the body at an angle greater than about 60° relative to a longitudinal axis of the body and less than perpendicular to the longitudinal axis.

56. (original): The transverse connector of claim 42, wherein the first opening includes an open side that allows the elongated member to be top loaded onto the elongated member.

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57. (canceled)

58. (currently amended): The transverse connector of claim 5742, wherein a position of the drive tool relative to the elongated member indicates if the body has been coupled to the elongated member.

59. (currently amended): The transverse connector of claim 5742, wherein a handle of the drive tool has an elongated portion that is substantially aligned with the elongated member when the transverse connector is coupled to the elongated member.

60. (original): The transverse connector of claim 42, further comprising a second opening in the body configured to couple to a second elongated member.

61. (original): The transverse connector of claim 60, wherein the body is substantially unbendable.

62. (previously amended): The transverse connector of claim 60, wherein the body is bendable to allow adjustment of the first opening relative to the second opening.

63. (previously amended): The transverse connector of claim 60, wherein the cam system is positioned between the first opening and the second opening.

64. (original): The transverse connector of claim 60, wherein the body comprises a first section configured to move relative to a second section, and further comprising a fastener configured to inhibit movement of the first section relative to the second section.

65. (original): The transverse connector of claim 42, wherein the connector is a transverse connector of a bone stabilization system.

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66. (original): The transverse connector of claim 42, wherein the connector is a transverse connector of a spinal stabilization system.

67. (original): The transverse connector of claim 42, wherein the body comprises a first section and a second section, wherein a position of the first section is adjustable relative to the second section, and further comprising a fastening system configured to fix the position of the first section relative to the second section during use.

68. (canceled)

69. (original): The transverse connector of claim 67, wherein the fastening system comprises a setscrew.

70. (currently amended): A connector, comprising:
a body;
a first opening in the body;
a second opening in the body; and
a cam system positioned in a cam system opening in the body, wherein the cam system is in communication with the first opening, and wherein the cam system is configured to extend an engager into the first opening; wherein the longitudinal axis of the cam system is angled at an angle between about 40° and about 90° with respect to the longitudinal axis of the body.

71. (previously amended): The connector of claim 70, wherein the cam system opening is positioned between the first opening and the second opening of the body.

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72. (original): The connector of claim 71, wherein a distance between a center of an elongated member positioned in the first opening and a center of an elongated member positioned in the second opening is greater than about 15 millimeters.
73. (original): The connector of claim 71, wherein a distance between a center of an elongated member positioned in the first opening and a center of an elongated member positioned in the second opening is less than about 45 millimeters.
74. (previously amended): The connector of claim 70, wherein the cam system opening is positioned so that the cam system is not located between the first opening and the second opening.
75. (original): The connector of claim 74, wherein a distance between a center of an elongated member positioned in the first opening and a center of an elongated member positioned in the second opening is greater than about 5 millimeters.
76. (original): The connector of claim 74, wherein a distance between a center of an elongated member positioned in the first opening and a center of an elongated member positioned in the second opening is less than about 30 millimeters.
77. (original): The connector of claim 70, wherein a longitudinal axis of the cam system is located substantially perpendicular to a longitudinal axis of the body.
78. (original) The connector of claim 70, wherein a longitudinal axis of the cam system is angulated within the body at a non-perpendicular angle relative to a longitudinal axis of the body.
79. (canceled)

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80. (currently amended): The connector of claim ~~78~~70, wherein the longitudinal axis of the cam system is angled at an angle between about 60° and about 90° with respect to the longitudinal axis of the body.

81. (previously amended): The connector of claim 70, wherein the engager extends into the first opening when the cam system is rotated, and wherein a rotation range of the cam system is limited.

82. (original): The connector of claim 81, wherein the rotation range of the cam system is limited to less than about 360°.

83. (original): The connector of claim 81, wherein the rotation range of the cam system is limited to less than about 180°.

84. (original): The connector of claim 81, wherein the rotation range of the cam system is limited to less than about 90°.

85. (original): The connector of claim 70, further comprising a vibrational indicator that informs a user that the cam system is engaged.

86. (original): The connector of claim 70, further comprising a visual indicator that informs a user that the cam system is engaged.

87. (original): The connector of claim 86, further comprising a drive tool that activates the cam system, and wherein the visual indicator is a position of a handle of a drive tool relative to a position of the elongated member.

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88. (original): The connector of claim 70, wherein the body comprises a first section configured to move relative to a second section, and further comprising a fastener configured to inhibit movement of the first section relative to the second section.

89. (original): The connector of claim 70 wherein the connector is a transverse connector of a bone stabilization system.

90. (original): The connector of claim 70, wherein the connector is a transverse connector of a spinal stabilization system.

91. (currently amended): A bone stabilization system, comprising:
a first elongated member coupled to bone by a first fixation element;
a second elongated member positioned adjacent to the first elongated member and coupled to bone by a second fixation element; and
a connector comprising a first opening configured to accept the first elongated member, wherein the connector is coupled to the first elongated member by a cam system positioned in a cam system opening in the connector, the connector comprising a first section and a second section, wherein a position of the first section is adjustable relative to the second section, and wherein a fastening system inhibits movement of the first section relative to the second section during use, the fastening system comprising a collet and a collar, and wherein the collar is friction locked to the collet to inhibit movement of the first section relative to the second section.

92. (original): The system of claim 91, wherein the connector further comprises an engagement system configured to couple the connector to the second elongated member.

93. (original): The system of claim 92, wherein the engagement system comprises a cam system.

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94. (original): The system of claim 91, wherein the connector further comprises an engagement system configured to couple the connector to the second fixation element.
95. (original): The system of claim 91, wherein the first elongated member and the second elongated member are portions of a unitary, bent and contoured member.
96. (original): The system of claim 91, wherein the connector has a substantially fixed length.
97. (original): The system of claim 96, wherein the length of the connector may be adjusted by bending the connector.
98. (original): The system of claim 97, wherein a body of the connector includes an indentation to facilitate bending the connector.
99. (canceled)
100. (canceled)
101. (canceled)
- 102-107 (canceled).
- 108-282. (previously canceled)
283. (canceled)

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284. (new): An engaging mechanism for coupling a connector to an elongated member, comprising:

a cam system positioned in a cam system opening in the connector, the cam system configured to extend an engager into an opening in the connector during use to couple the connector to the elongated member, wherein the cam system is angulated within the transverse connector at an angle greater than about 45° relative to a longitudinal axis of the transverse connector and less than perpendicular to the longitudinal axis.

285. (new): The engaging mechanism of claim 284, wherein the cam system is angulated within the transverse connector at an angle greater than about 60° relative to a longitudinal axis of the transverse connector and less than perpendicular to the longitudinal axis.

286. (new): A transverse connector comprising:

a body comprising a first section and a second section, wherein a position of the first section is adjustable relative to the second section, and further comprising a fastening system configured to fix the position of the first section relative to the second section during use, the fastening system comprising a collet and a collar, and wherein the collar is compressed onto the collet to fix the position of the first section relative to the second section;

a first opening in the body configured to accept an elongated member;

a cam system positioned in a cam system opening in the body, wherein the cam system is in communication with the first opening; and

an engager configured to extend into the first opening to couple the elongated member to the body when the cam system is activated.